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ABSTRACT OF THE INVENTION

The present invention provides a pressure sensing device that includes at least one TMR sensor, and preferably an array of TMR sensors, with each TMR sensor having an insulating spacer layer interposed between a pinned and a free ferromagnetic layer. In an unbiased state, the magnetization vector of each of the ferromagnetic layers is preferably parallel to each other. Upon application of a small voltage, the magnetization vectors remain unchanged. Upon application of stress, the magnetization vector of the free magnetic layer will rotate, thus causing a corresponding and proportionally related change in the resistance of the sensor. This change in resistance can be sensed and used to calculate the stress applied thereto.

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